

Artificially intelligent imaging (AI²): CMOS imaging & standard CMOS moving together in 3D nanoscale integration and even impacting PVS

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In this talk we will present our approach of Artificially-Intelligent Implementations (AI²) in the multi-disciplinary area of CMOS Imaging. Inspired by the Biological Vision systems, we took the top-down approach: From system level, down to circuits, down to devices reaching the hot topic of 3D CMOS Imaging at the device level which (currently and is) predicted to have a huge impact in the coming years not only on CMOS imaging but in the overall Integrated Circuits design technologies. Dedicated initially to Smart CMOS imaging, the novel technology is the application of choice where multi-disciplines (Biology, Optics, Devices' CAD/CAE, and finally Nano-Fabrication) will interact to suggest a novel approach for the quest to design intelligent devices needed in a variety of advanced technological devices and systems including Solar energy harvesting Photovoltaics. As natural evolution, we will show our research on taking the benefits achieved from 3D Smart CMOS Imagers and applying them on Photovoltaics technology to design an intelligent High Efficiency solar energy harvesting. The talk will show this fascinating dynamics and open doors to potential future fields of research and development.

Biography:

Dr. Faycal Saffih (IEEE, 2000) received B.Sc. (Best Honors) in Physics from University of Setif-1, Algeria, in 1996, M.Sc. degree in Physics from University of Malaya, Malaysia, in 1998, and Ph.D. degree in Electrical and Computer Engineering from the University of Waterloo, Canada, in 2005. In 2006, he joined the Communication Research Laboratory, McMaster University, Hamilton, ON, where he developed a versatile FPGA-based prototype for biomedical smart imaging application known as the wireless endoscopic capsule. Dr. Faycal Saffih joined Voxel Inc., OR, USA, as Senior Analog Active Pixel Sensor engineer, designing imagers based on SOI-CMOS technology for the CMOS imagers used in high-energy physics detection, and electrons microscopy imaging. From 2009 until 2012, he joined KAUST as Research Fellow where incepted his invention on Smart Nano-photonics devices dedicated for imaging and solar energy harvesting. He recently got certified from Renewables Academy (RENAC: www.renac.de), Germany, for developing Renewable Energy projects.